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**CUSTOMER RELATIONSHIP MANAGEMENT SYSTEM AND METHOD****FIELD OF INVENTION**

- 5 The invention relates to a customer relationship management system and method.

**BACKGROUND TO INVENTION**

- 10 The low cost of data storage hardware has led to the collection of large volumes of data. Merchants, for example, generate and collect large volumes of data during the course of their business. To compete effectively, it is necessary for a merchant to be able to identify and use information hidden in the collected data. The task of identifying this hidden information has proved very difficult for merchants.

- 15 In the case of a promotional campaign on an existing customer database, it is often very difficult for a merchant to estimate the effectiveness of the promotional campaign. In many cases, the merchant needs to run several complicated queries on a customer database and so requires vast technical knowledge to formulate the appropriate queries.

- 20 Similarly, understanding the changes in behaviour of different customer demographics can be a difficult task, and without such understanding an effective promotional campaign cannot be systematically formulated.

25 **SUMMARY OF INVENTION**

- In broad terms in one form the invention comprises a customer relationship management system comprising a memory in which is maintained an interaction database of interaction data representing interactions between customers and  
30 merchants; retrieval means arranged to retrieve, based on a set of criteria, a promotional group subset of the customers stored in the interaction database; promotion analyser arranged to retrieve from the interaction database data representing interactions involving customers in the promotional group; and display means arranged to display a representation of the retrieved interaction data.

35

In broad terms in another form the invention comprises a method of managing customer relationships comprising the steps of maintaining in a memory an interaction database of interaction data representing interactions between customers and merchants; retrieving, based on a set of criteria, a promotional group subset of  
5 the customers stored in the interaction database; retrieving from the interaction database data representing interactions involving customers in the promotional group; and displaying a representation of the retrieved interaction data.

In another form in broad terms the invention comprises a customer relationship  
10 management computer program comprising an interaction database of interaction data representing interactions between customers and merchants maintained in a memory; retrieval means arranged to retrieve, based on a set of criteria, a promotional group subset of the customers stored in the interaction database; promotion analyser arranged to retrieve from the interaction database data  
15 representing interactions involving customers in the promotional group; and display means arranged to display a representation of the retrieved interaction data.

**BRIEF DESCRIPTION OF THE FIGURES**

Preferred forms of the customer relationship management system and method will now be described with reference to the accompanying figures in which:

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Figure 1 shows a block diagram of the system in which one form of the invention may be implemented;

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Figure 2 shows the preferred system architecture of hardware on which the present invention may be implemented showing the promotion manager and promotion analyser;

Figure 3 is a flowchart showing operation of the promotion manager of Figure 2;

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Figures 4 to 10 are screen shots showing use of the preferred promotion manager of Figure 2;

Figure 11 is a campaign screen;

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Figure 12 is a flow chart showing operation of the promotion analyser of Figure 2;

Figure 13 is an example display produced by the promotion analyser of Figure 2; and

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Figures 14 to 16 show typical displays generated for a user identifying trends in customer demographic groups.

**DETAILED DESCRIPTION OF PREFERRED FORMS**

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Figure 1 illustrates a block diagram of the preferred system 10 in which one form of the present invention may be implemented. The system includes one or more clients 20 for example 20A, 20B, 20C, 20D, 20E and 20F, which each may comprise a personal computer or workstation described below. Each client is interfaced to the system 10 as shown in Figure 1. Each client 20 could be connected to the system 10 through a local area network or LAN, or could be connected through the Internet.

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Clients 20A and 20B, for example, are connected to a network 22, such as a local area network or LAN. The network 22 could be connected to a suitable network server 24 and communicate with the rest of the system 10 as shown. Client 20C is shown connected directly to the system. Clients 20D, 20E and 20F are shown  
5 connected to the system 10 through the Internet 26. Client 20D is shown as connected to the Internet 26 with a dial-up connection and clients 20E and 20F are shown connected to a network 28 such as a local area network or LAN, with the network 28 connected to a suitable network server 30.

10 The preferred system 10 further comprises a data repository 40, for example a data warehouse maintained in a memory. It is envisaged that the data repository may alternatively comprise a single database, a collection of databases, or a data mart. The preferred data repository 40 includes data from a variety of sources. The data repository may include, for example, interaction data 42 representing interactions  
15 between customers and merchants, as will be more particularly described below. The data repository may also include data from other sources, for example census data 44, scan data 46 obtained from scanning barcodes on products, data from merchant customer databases 48, data from merchant loyalty programmes 50 and/or promotion data 52 held by a merchant or other organisation. The preferred  
20 data repository 40 could be implemented on an AIX database platform in RDBMS (Sybase adaptive server), Sybase IQ and/or SQS.

One preferred form of the system 10 further comprises an application server platform 60 interfaced to the data repository 40 via a Gigabit network. The server platform 60  
25 preferably operates under Windows NT or any other suitable operating and application software. The server platform 60 preferably includes a data memory 62, a request server 64 and a multi-media server 66. A user of the system, for example a merchant, could request the creation of a business object which could be a data visualisation in the form of a map or graph. The system 10 preferably includes a  
30 specific memory 68 known as a "SeeStore" in which such business object creation requests are placed. The request server 64 is interfaced to the SeeStore 68 and passes the requests on to the multi-media server 66. The multi-media server 66 creates the requested business object and stores this business object in the SeeStore 68. The resulting business objects are then displayed on a client workstation 20, as  
35 will be described below.

A further preferred form system 10 includes a metadata interpreter 70 and a memory 72 specific for storing metadata. The metadata store 72 and the metadata interpreter 70 enable the system to be mapped onto diverse business domains, while still presenting a very simple interface to the end user. The combination enables  
5 business rules to be encoded in a way which is domain independent.

Figure 2 shows the preferred system architecture of a client 20. The computer system 100 typically comprises a central processor 102, a main memory 104 for example RAM and an input/output controller 106. The computer system 100 also  
10 comprises peripherals such as a keyboard 108, a pointing device 110 for example a mouse, track ball or touch pad, a display or screen device 112, a mass storage memory 114, for example a hard disk, floppy disk or optical disc, and an output device 116 for example a printer. The system 100 could also include a network interface card or controller 118 and/or a modem 120. The individual components of  
15 the system 100 could communicate through a system bus 122.

The preferred client system 100 further comprises a promotion manager 130 and a promotion analyser 140 stored in the mass storage memory 114. The functionality of the promotion manager 130 and promotion analyser 140 is further described below.  
20 It is envisaged that the promotion manager 130 and promotion analyser 140 could be installed on individual client machines 20, could be installed on the application server 60 or could be installed on a further server in the system 10.

In one form the invention is arranged to display data representing customer  
25 relationships involving one or more merchants. Typically, a merchant will operate in a commercial premises or store from which a customer purchases goods or services. The merchant may, for example, operate a petrol station in one or more geographic locations. The merchant may alternatively operate a wagering or betting service, or operate a casino or other gaming facility in which a number of gaming machines and  
30 stations are positioned in one or more rooms at a common venue. The merchant may also operate a warehouse facility, manufacturing facility, car parking premises, telecommunications network or web site. The merchant may also offer a range of financial or insurance services.

35 The merchant does not necessarily need to operate from a commercial premises or store. For example, the merchant may operate from strategically placed machines

for example vending machines or amusement machines. The merchant may also operate a mail order catalogue service, operate a cell centre, direct market goods or services, or operate from a website or other electronic medium. It will be appreciated that the nature of business of a merchant includes a wide range of activities.

5

As a customer interacts with a merchant, the interaction generates interaction data which is then migrated to the data repository 40. The interaction data could be stored in a number of records in a relational database. Each record may include a merchant identifier used to identify a particular merchant, and where a merchant  
10 operates from more than one geographic location, the merchant identifier or some other identifier included in the record may identify the geographic location in which the interaction occurs.

15

The record could also include a customer identifier. The merchant may, for example, issue an incentive-supported customer loyalty card which is then used by the customer during interactions with the merchant. The loyalty card preferably has stored on it a customer identifier and may have stored other data, for example residential address and family size of the customer. Such data is stored in loyalty programme database 50 and could be migrated to the data repository 40.

20

Where the merchant operates retail premises, the merchant may have installed apparatus for reading the bar codes of products sold. Alternatively, each product may be identified by a code assigned by the merchant which is recorded at the time of sale. Such data is stored in a scan database 46 and could be migrated to the data  
25 repository 40. In this way, the record may also include a suitable goods or services identifier, for example a product or service code to identify which goods or services were involved in the interaction.

30

The record may also include data such as the date and/or time at which the interaction between the customer and merchant took place and/or the cash value of the transaction.

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The interaction data is migrated to the data repository 40, generally by way of daily updates or in real time. It is advantageous to cleanse, catalogue and validate the interaction data during migration of the data to the data repository, and this task could be performed by either the merchant or by a third party. Once stored in the



data repository 40, the data could be linked to other sources of data for subsequent retrieval, for example the census data 44, scan data 46, data from the merchant customer database 48, data from a merchant loyalty programme 50 and/or promotion data 52 held by the merchant.

5

The data repository 40 could be maintained by a merchant or alternatively could be maintained by a third party. Updates to the data repository could be carried out by the merchant directly, or alternatively the merchant could provide batched data to a third party for updating the data. Alternatively, a third party could be entrusted with the task of collecting the interaction data and migrating the data to the data repository.

10

It is good commercial practice for a merchant to conduct campaigns to attract more business from existing customers and also to attract new customers. Referring to Figure 3, a preferred form of the invention permits a user to define a campaign, indicated at 200. Details of the campaign are stored in memory, for example the SeeStore 68. As shown at 202, the user defines a promotional group as part of the campaign. This promotional group may be selected on characteristics such as age group, gender, and/or other criteria, as will be particularly described below.

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It is envisaged that the promotional group could comprise all customers stored in memory having stored transactions with a particular merchant. Alternatively the promotional group could comprise a subset of the group of customers having stored transactions with a particular merchant. Where data involving more than one merchant is stored in memory, the promotional group could comprise customers having stored transactions with different merchants.

25

As a further alternative, it is envisaged that the promotional group could include customers not having stored transactions with a particular merchant, for example potential customers. The term "customers" as used in the specification includes potential customers.

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Once the promotional group has been defined by the user, that promotional group is stored in memory. The system could store, for example, the set of customer identifiers uniquely identifying the set of customers.

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The preferred system may permit the user to select a particular target group and then generate a mailing list automatically. It will be appreciated that a single campaign may target distinct promotional groups. These distinct promotional groups may have different demographics and personal characteristics and so promotions may be tailored depending on the characteristics of the individual promotional groups. For example, a group of elderly women may require a different series of promotional initiatives to another group consisting primarily of young males.

10 The preferred system provides a simple wizard to assist a user in defining individual promotional groups. This wizard will now be described with reference to Figures 4 to 10 in a series of seven simple steps.

Figure 4 shows the window presented to the user when first selecting the wizard.  
15 The preferred window comprises a query panel 300, a group summary panel 302, and a group percentage 304. Figure 4 illustrates the first query presented to the user in the query panel 300. The user is asked whether the user wishes to specify an age group or whether the age group is not important to the user. Preferably, the user is provided with a drop down list box permitting the user to select the  
20 appropriate age category.

The group summary panel 302 shows the user which characteristics have been selected to date to define the promotional group. The preferred characteristics are age, sex or gender, spending habits, visit frequency and address mesh block or area.  
25 It is envisaged that this list of characteristics may be reduced or may be added to by a user.

Panel 304 shows the percentage of the available customers the new promotional group represents. Initially, the new group represents all available customers.  
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Using the buttons on the navigational panel 306, the user may navigate between the different steps.

As shown in Figure 5, the age of the group is not important to the user and has not  
35 been selected. The information is indicated to the user in the group summary panel in Figure 5. As shown in Figure 5, the user may select a particular gender.

Referring to Figure 6, the user has specified that the promotional group must be males and so this criteria is shown in the group summary panel in Figure 6. The group percentage panel in Figure 6 has been updated to show that the current promotional group comprises half of the available customers. The query panel in Figure 6 allows the user to specify the average amount of money spent per visit by the customer of interest. The categories could be, for example, less than \$10, \$10-\$50, \$50-\$200, \$200-\$1,000, \$1,000-\$10,000 and/or greater than \$10,000.

Referring to Figure 7, the user has specified that the promotional group must spend between \$10 to \$50 on average per visit at the casino. The group summary panel in Figure 7 is updated to reflect this information and the promotional group now represents 29% of the available customers. The user may specify in the query panel the average number of times individual customers visit the casino. The categories could be, for example, once a year, once every six months, once every three months, once a month, once every two days, once a week, twice a week, once a day and/or twice a day.

Referring to Figure 8, the group summary panel is updated with the visit frequency specified as once a month and the promotional group now represents 11% of the available customers. The query panel in Figure 8 displays a topographical map of the region. The preferred map is centred around the location of the casino with areas defined as concentric circles centred on the casino, further divided into quadrants. The user may select one or more areas in the vicinity of the casino by clicking in the area of interest. This selects customers who reside in a particular area, or whose customer provenance is within the selected quadrant.

As shown in Figure 8, the particular area selected is shaded. It will be appreciated that the user may select more than one area, for example by holding down a control key and clicking in two or more areas. Alternatively, the user may click in one area and drag the cursor over more than one area while holding down the mouse button to select neighbouring sectors. The map may also be provided with scroll bars to permit the user to select areas not immediately visible in the query window. The system may also provide the user with buttons to adjust the scale of the map.

As shown in Figure 9, the user may enter a group description and store this description with the promotional group. For example, there may be some characteristic behaviour which can be associated with the particular group and entering this characteristic behaviour may assist a user to recall the reasons behind  
5 selection of the individual characteristics.

As shown in Figure 10, the user may specify a descriptive name by which to index the group and this descriptive name is updated in the group summary panel.

10 Referring to Figure 11, the system provides the user with a campaign screen to allow users to define promotions and associate them with particular campaigns. The campaign screen may comprise, for example, a campaign panel 350, a promotion panel 352 and a graph panel 354 showing graphical representations of individual promotion durations.

15 Campaign panel 350 may display, for example, a campaign identifier, description explanation and notes relating to the campaign, and other details, for example the beginning and end dates for the campaign. The campaigns are preferably stored in memory and indexed by a campaign identifier.

20 The promotion panel 352 displays to the user the individual promotions forming part of a particular campaign. The promotion panel in particular displays characteristics of the promotion. Individual promotions are preferably stored in memory, together with and indexed by a promotion identifier and preferably also by a campaign  
25 identifier.

The graph panel 354 could display to the user the durations of individual promotions, together with start dates and end dates. The graph panel may include a legend identifying the individual promotions and may also include the promotion  
30 identifier (shown as a 5 digit promotion number) and the promotion name.

The campaign window preferably includes navigation buttons shown at the bottom of the screen permitting the user to navigate between promotions and to navigate between campaigns.

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Once a campaign has been identified and is under way, it is important for the merchant to monitor the effectiveness of the campaign as a whole and of individual promotions within the campaign. The system provides a promotion analyser to assist the user in this regard. Figure 12 illustrates the preferred method followed by the promotion analyser.

The promotion analyser begins by retrieving from memory the campaign to be analysed, indicated generally at 400. Preferably the campaign identifier is used as a primary key to retrieve an individual campaign. Once the campaign has been retrieved from memory, the individual promotions associated with that campaign are also retrieved from memory, indicated at 402.

Target groups and control groups relevant to a particular promotion are then retrieved from memory, as indicated at 404 and 406 respectively.

Once the target and control groups have been retrieved from memory, representations of the target group and control group are displayed on a client display device as indicated at 408 and 410 respectively. Figure 13 illustrates how the system may display representations of the target and control groups. The invention in one preferred form could be arranged to display a contoured representation of data superimposed on a graphical spatial representation of the premises of the merchant generated by the system. Contoured representations are further described in our patent specification PCT/NZ00/00099 to CompuDigm International Limited, filed on 14 June 2000 entitled "Data visualisation system and method" which is incorporated by reference.

Figure 13 illustrates an example of a display generated by the system where the merchant operates a casino or similar gaming venue. In this example, a representation of the merchant is generated and displayed in accordance with the invention. The graphical representation comprises a spatial representation of an area of the casino showing the layout of individual gaming machines and stations.

It will be appreciated that where a merchant operates from a retail store, the graphical representation could include a graphical spatial representation of the store. Where the merchant operates from a number of retail stores, the graphical representation could include spatial representations of each store and could also

include a large scale map of the geographical area in which the merchant's stores are located.

5 Where the merchant operates a warehouse, the representations could show the layout of various goods stored by the merchant. Where the merchant provides services, for example financial services, the representations could include schematic representations of the different areas of services offered by the merchant.

10 Referring to Figure 13, the system may display a graphical representation of the promotion or target group shown at 500 and may also display graphically a representation of the control group indicated at 502. Panels 500 and 502 show the layout of individual gaming machines, one of which is indicated at 504.

15 Using customer identifiers as primary keys, the system retrieves data on each customer from memory. This data could include, for example, dates and times of visits to the casino and details of individual transactions. This data is superimposed on the spatial representation of the casino shown in panels 500 and 502. The preferred system represents these financial details as contours around or adjacent to individual gaming machines. The example provided in Figure 13, for example,  
20 contours the information based on net revenue. This net revenue could be obtained by the sum of the total money spent by individual customers at the casino during the period of interest.

25 The revenue for each machine is preferably graphically represented adjacent or near to the representation of the individual machine. There are a finite number of machines in the casino, and the individual revenues generated from each machine represent a finite set of data values. These data values are graphically illustrated as data points in the representations 500 and 502.

30 The preferred representations are colour-coded and the value of revenue of each machine is illustrated by representing the corresponding data points in the appropriate colour to represent the correct value of revenue of each machine.

35 The areas of the representations 500 and 502 around each data point are shown as contours. The nature of the contours for each data point are preferably represented to gradually drop off or fall away from each data point. Each data point could be

presented by  $x$  and  $y$  co-ordinates indicating the relative position of each data point in the presentation. Each data point could also have a  $z$  value representing the height or magnitude of the data point. This  $z$  value could indicate, for example, the revenue or data value at a particular data point. Each data value is therefore  
5 centred on a data point.

Net revenue is one of the key performance indicators (KPI) which may be represented. Other indicators could be turnover, sales, gross profit, net profit, gross margin return on inventory investment (GMROI), net margin return on inventory investment  
10 (NMROI), and return on net asset (RONA).

A legend may be displayed to the user to assist in clarifying the information presented in panels 500 and 502.

15 The promotion analyser permits the user to examine a visualisation of interaction data involving customers. This data visualisation is a useful complement to other reporting tools such as the use of charts and graphs. The promotion analyser permits a user to make sense of and obtain useful data without requiring technical knowledge. Patterns in the data can be quickly identified and compared.

20 For example, by displaying representations of the target group in panel 500 and displaying representations of the control group in panel 502, the user can quickly and readily identify the effects a campaign has had on the behaviour of the customers.

25 It is envisaged that the system may display to the user snapshots at particular times and dates throughout a particular campaign. The system may alternatively or in addition display to the user animated sequences of customer behaviour over a period selected by the user.

30 The promotion analyser may also automatically correct for effects external to the promotion. For example, external factors such as school holidays, weather, and the economy in general, may effect the behaviour of individual customers. These factors will affect the customers in a promotional group, whether or not the customer is in a  
35 target group.

The promotion analyser may, for example, subtract the weighted effect of the control group in a promotion group from the target group in that promotion group. This removes the noise from the data sample, leaving only data patterns directly attributable to the promotion or campaign.

5

In some circumstances, a user will wish to identify trends in interactions with customers of a particular demographic category. As described above, the invention enables a promotional group of customers to be defined using a set of criteria. The set of criteria used to define such a group is referred to as a profile. Such a profile could be all females under 21 who are customers of a merchant. Such a profile is an abstract definition of a set of behaviours to which customers may conform in order to qualify for group membership. Alternatively, the profile could be simply a fixed group of customers, changing through time.

10

15 The set of customers who are members of a group during a given time period is known as a snapshot of the profile. Such a snapshot could include all members of a given profile interacting with a merchant on a particular day. The invention preferably enables an arbitrary number of snapshots of a profile to be created, and display to a user time series graphs of KPIs associated with the snapshots.

20

Figure 14 illustrates a typical display presented to a user, which would allow a user to quickly identify changing trends within different customer groupings. The invention is preferably arranged to enable a user to define arbitrary events which could be overlayed on the time series graphs, for example promotions or external events which may impact on business KPIs.

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Figure 14 shows two time series graphs for a set of snapshots for a profile of under 21 females who are customers of a particular merchant. The profile criteria are preferably shown in panel 600. The profile criteria have preferably been defined using the Wizard described above with reference to Figures 4 to 10. The invention could also display notes regarding the particular profile in panel 602 and a profile description in panel 604.

30

Panel 606 preferably shows a bar chart containing all the KPIs measured for the currently selected snapshot expressed as a percentage of these KPIs for all customers over the snapshot interval. Such KPIs could include, as shown in Figure 14,

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turnover, patron count, trip count, time played and occupancy. The same data could be shown numerically in panel 608.

5 Display panel 610 graphically displays two KPIs, turnover and trip count. It is envisaged that the user could select other snapshots by using a pointing device to select the appropriate snapshot on the time series charts shown at 612. Shown at 614 is a promotional event instituted by a merchant, for example happy hour. It can be readily identified from the representation shown in Figure 14 that the customer group in this particular profile shows increased turnover and trip count during the  
10 course of the promotion.

Referring to Figure 15, the invention could display in panel 620 a pre-defined query called leavers and joiners, which would enable a merchant to identify those customers who have left, joined or remained in a profile over a predefined time  
15 interval by performing the appropriate set operations on two snapshots of the profile.

Alternatively, as shown in Figure 16, panel 630 could display the results of a further query enabling a user to identify members of a profile who have visited more or less than a certain threshold number of times, or who have spent more or less than a  
20 threshold amount during a time period, over an arbitrary time period. Such members could be the subject of a further promotion.

In summary, the invention provides a customer relationship management system and method designed to assist a merchant to manage campaigns involving  
25 customers of that merchant. The invention provides a system and method of selecting customers to include in a campaign and a system and method for evaluating the effectiveness of that campaign. The invention also enables a user to track changes in customer habits over time.

30 The foregoing describes the invention including preferred forms thereof. Alterations and modifications as will be obvious to those skilled in the art are intended to be incorporated within the scope hereof, as defined by the accompanying claims.

**CLAIMS**

1. A customer relationship management system comprising:  
a memory in which is maintained an interaction database of interaction data  
5 representing interactions between customers and merchants;  
retrieval means arranged to retrieve, based on a set of criteria, a promotional  
group subset of the customers stored in the interaction database;  
a promotion analyser arranged to retrieve from the interaction database data  
representing interactions involving customers in the promotional group; and  
10 display means arranged to display a representation of the retrieved  
interaction data.
2. A customer relationship management system as claimed in claim 1 wherein  
the promotional group subset of the customers comprises at least one target group of  
15 customers to which promotional efforts will be directed; and at least one control  
group of customers to which promotional efforts will not be directed, the target group  
and the control group comprising mutually exclusive sets.
3. A customer relationship management system as claimed in claim 2 wherein  
20 the promotion analyser is arranged to retrieve from the interaction database data  
representing interactions involving customers in the target group and data  
representing interactions involving customers in the control group.
4. A customer relationship management system as claimed in claim 2 or claim  
25 3 wherein the retrieval means is arranged to randomly select the target group and/or  
control group from the promotional group.
5. A customer relationship management system as claimed in claim 1 wherein  
the promotion analyser is arranged to retrieve from the interaction database data  
30 representing interactions involving customers in the promotional group during a first  
time period and a second time period.
6. A customer relationship management system as claimed in any one of the  
preceding claims wherein the display means is further arranged to display a  
35 graphical representation of at least one merchant and to superimpose

representations of the data retrieved from the interaction database on the representation(s) of the merchant.

7. A customer relationship management system as claimed in claim 6 wherein the merchant operates from one or more commercial premises, the graphical representation comprising a spatial representation of the premises of the merchant.

8. A customer relationship management system as claimed in any one of the preceding claims wherein the display means is further arranged to display a topological map showing the origin of customers in merchant customer interactions.

9. A method of managing customer relationships comprising the steps of:  
maintaining in a memory an interaction database of interaction data representing interactions between customers and merchants;

retrieving, based on a set of criteria, a promotional group subset of the customers stored in the interaction database;

retrieving from the interaction database data representing interactions involving customers in the promotional group; and

displaying a representation of the retrieved interaction data.

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10. A method as claimed in claim 9 wherein the promotional group subset of the customers comprises at least one target group of customers to which promotional efforts will be directed; and at least one control group of customers to which promotional efforts will not be directed, the target group and the control group comprising mutually exclusive sets.

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11. A method as claimed in claim 10 further comprising the step of retrieving from the interaction database data representing interactions involving customers in the target group and data representing interactions involving customers in the control group.

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12. A method as claimed in claim 10 or claim 11 further comprising the step of retrieving data through random selection of the target group and/or control group from the promotional group.

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13. A method as claimed in claim 9 further comprising the step of retrieving from the interaction database data representing interactions involving customers in the promotional group during a first time period and a second time period.

5 14. A method as claimed in any one of claims 9 to 13 further comprising the steps of displaying a graphical representation of at least one merchant and superimposing representations of the data retrieved from the interaction database on the representation(s) of the merchant.

10 15. A method as claimed in claim 14 wherein the merchant operates from one or more commercial premises, the graphical representation comprising a spatial representation of the premises of the merchant.

15 16. A method as claimed in any one of claims 9 to 15 further comprising the step of displaying a topological map showing the origin of customers in merchant customer interactions.

17. A customer relationship management computer program comprising:  
an interaction database of interaction data representing interactions between  
20 customers and merchants maintained in a memory;  
retrieval means arranged to retrieve, based on a set of criteria, a promotional group subset of the customers stored in the interaction database;  
promotion analyser arranged to retrieve from the interaction database data representing interactions involving customers in the promotional group; and  
25 display means arranged to display a representation of the retrieved interaction data.

18. A computer program as claimed in claim 17 wherein the promotional group subset of the customers comprises at least one target group of customers to which  
30 promotional efforts will be directed; and at least one control group of customers to which promotional efforts will not be directed, the target group and the control group comprising mutually exclusive sets.

19. A computer program as claimed in claim 18 wherein the promotion analyser  
35 is arranged to retrieve from the interaction database data representing interactions

involving customers in the target group and data representing interactions involving customers in the control group.

20. A computer program as claimed in claim 18 or claim 19 wherein the retrieval means is arranged to randomly select the target group and/or control group from the promotional group.

21. A computer program as claimed in claim 17 wherein the promotion analyser is arranged to retrieve from the interaction database data representing interactions involving customers in the promotional group during a first time period and a second time period.

22. A computer program as claimed in any one of claims 17 to 21 wherein the display means is further arranged to display a graphical representation of at least one merchant and to superimpose representations of the data retrieved from the interaction database on the representation(s) of the merchant.

23. A computer program as claimed in claim 22 wherein the merchant operates from one or more commercial premises, the graphical representation comprising a spatial representation of the premises of the merchant.

24. A computer program as claimed in any one of claims 17 to 23 wherein the display means is further arranged to display a topological map showing the origin of customers in merchant customer interactions.

25. A computer program as claimed in any one of claims 17 to 24 embodied on a computer readable medium.

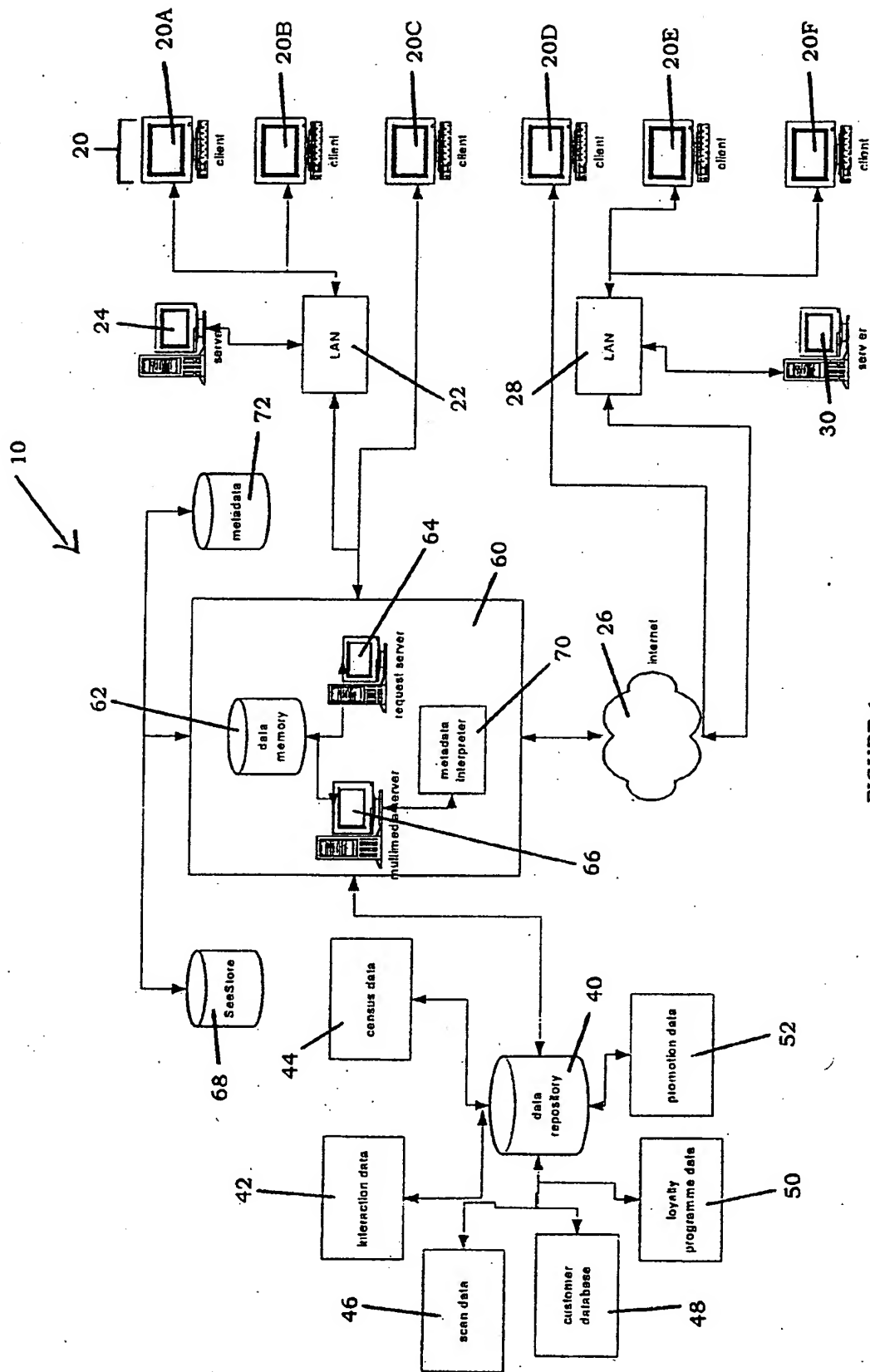


FIGURE 1

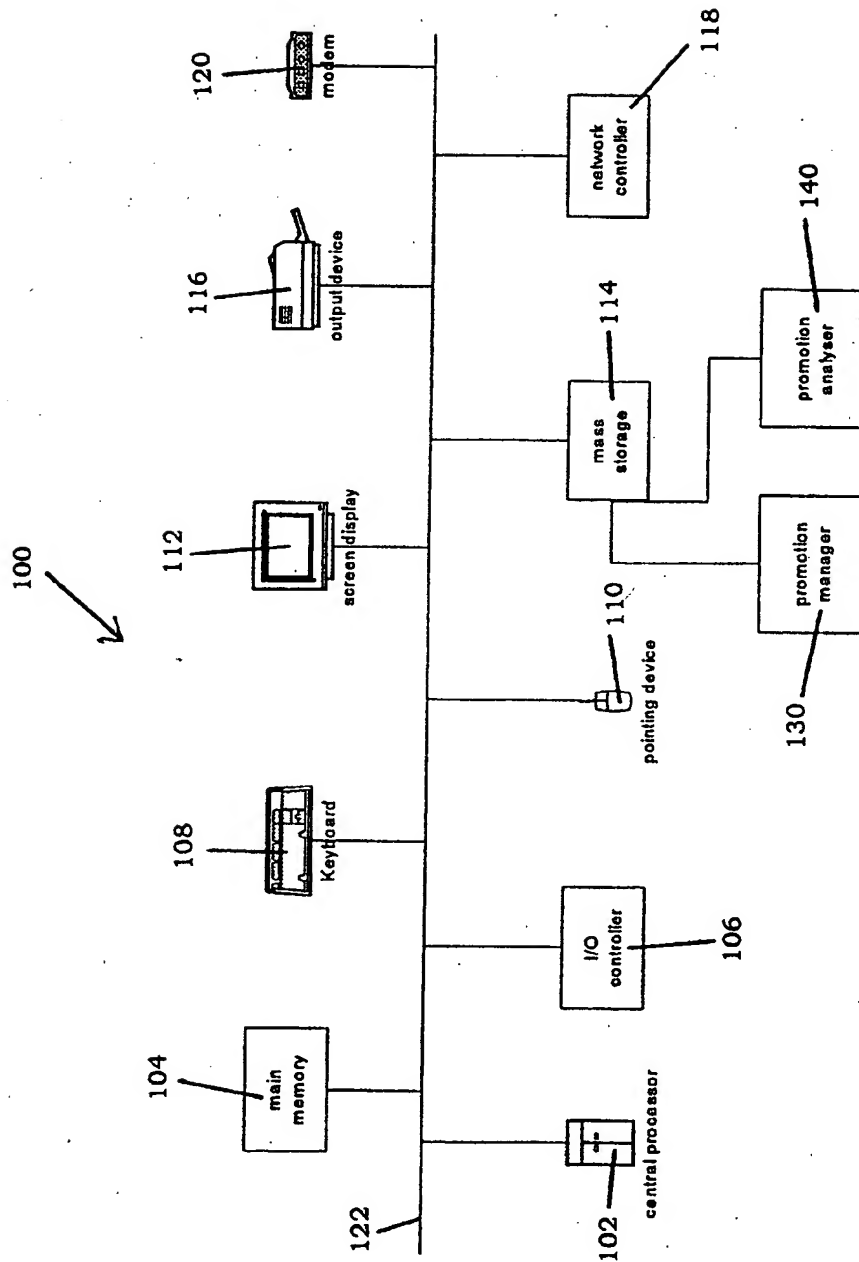


FIGURE 2

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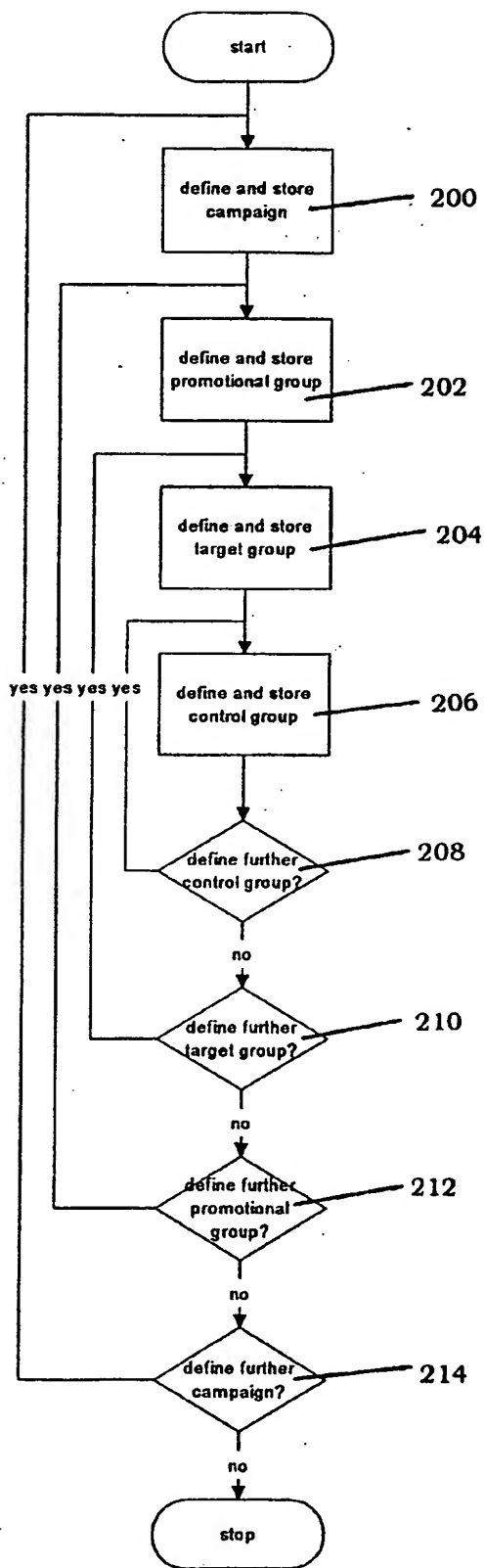


FIGURE 3



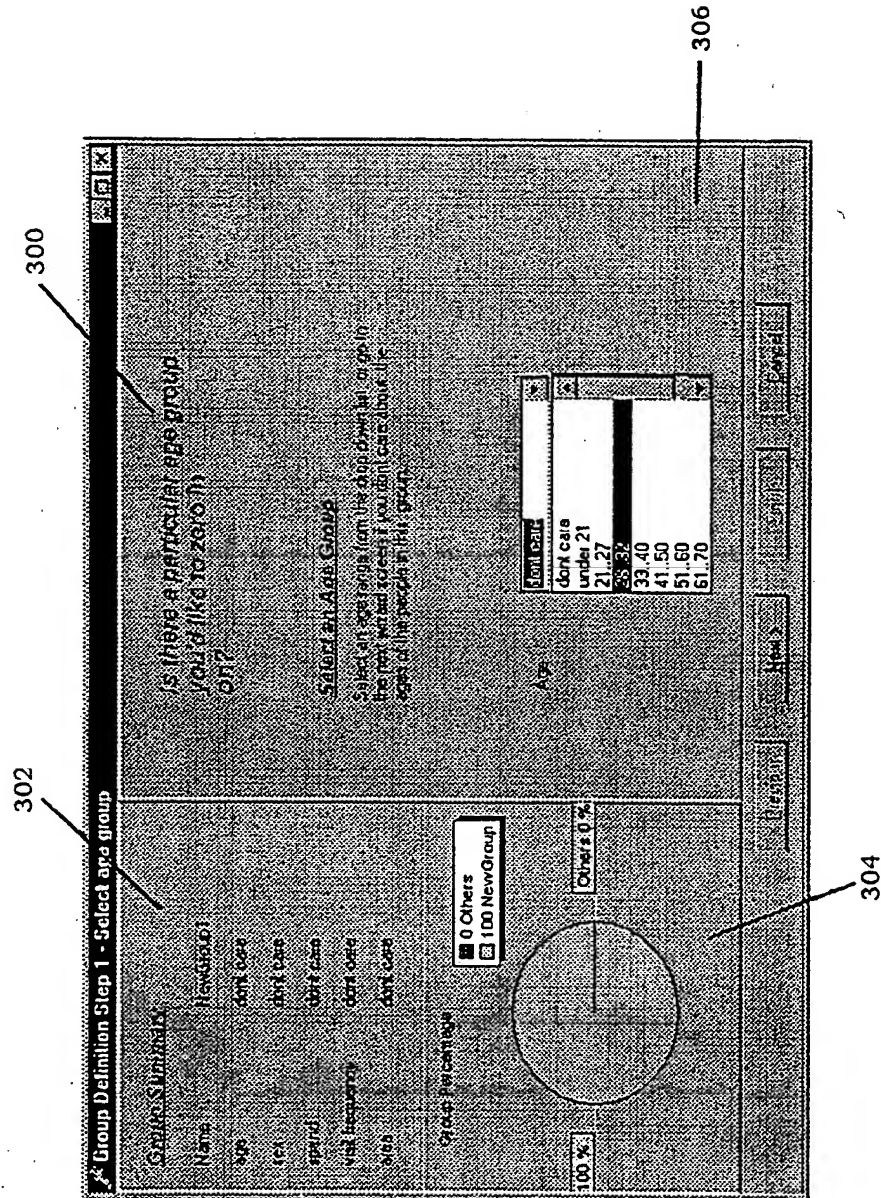


FIGURE 4

Group Definition Step 2 select gender															
<p><b>Group Summary</b></p> <table border="1"> <thead> <tr> <th>Name</th> <th>New Group</th> </tr> </thead> <tbody> <tr> <td>Age</td> <td>1000000</td> </tr> <tr> <td>Sex</td> <td>1000000</td> </tr> <tr> <td>Gender</td> <td>1000000</td> </tr> <tr> <td>Age</td> <td>1000000</td> </tr> <tr> <td>Sex</td> <td>1000000</td> </tr> <tr> <td>Gender</td> <td>1000000</td> </tr> </tbody> </table>		Name	New Group	Age	1000000	Sex	1000000	Gender	1000000	Age	1000000	Sex	1000000	Gender	1000000
Name	New Group														
Age	1000000														
Sex	1000000														
Gender	1000000														
Age	1000000														
Sex	1000000														
Gender	1000000														
<p><b>Group Characteristics</b></p> <table border="1"> <thead> <tr> <th>100%</th> <th>0%</th> </tr> </thead> <tbody> <tr> <td colspan="2"> </td> </tr> </tbody> </table>		100%	0%												
100%	0%														
<p><b>Do you want to target a particular gender?</b></p> <p><b>Select a Gender</b></p> <p>Select which gender you would like to include in the group or you can select none if you want the group to include both men and women</p> <p>Gender: <input type="text" value="Male"/></p> <p>Gender: <input type="text" value="Female"/></p> <p>Gender: <input type="text" value="Male or Female"/></p>															

FIGURE 5

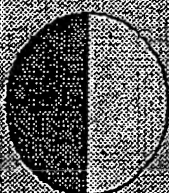
**Group Definition Step 3 - select average spend**

**Group Summary**

Name	NewGroup1
Sp	Conf case
Prs	Plan
Grp	Conf case
Alt frequency	Conf case
Age	Conf case

**Group Percentage**

☒ 50 Others  
☐ 50 NewGroup



**NewGroup: 50 %**

**How much do people in this group typically spend when they visit the casino?**

**Select Average Spend**

Select an average spend to set from the drop down list to go to the next wizard screen. You don't want about how much people in this group spend at the casino.

Spend

Conf Case
Conf case less than \$10
110 to \$50
\$50 to \$200
\$200 to \$1000
\$1000 to \$10,000
greater than \$10,000

Navigation buttons: < Previous, Next >, Cancel

FIGURE 6

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**Group Definition Step 4- select visitation frequency**

*How often do people in this group typically visit the casino?*

**Group Summary**

Name	NewGroup1
age	dont care
sex	Male
spend	\$10 to \$50
visit frequency	dont care
area	dont care

**Group Percentage**

Others 71.5% ☐ 71 Others

☐ 29 NewGroup

NewGroup 28.5%

**Select Visitation Frequency**

Select an average visitation frequency from the drop down list, or go to the next wizard screen if you dont care about how often the people in this group visit the casino.

Frequency:

- dont care
- once a year
- once every 6 months
- once every three months
- once a month**
- once every two days
- once a week
- twice a week

FIGURE 7

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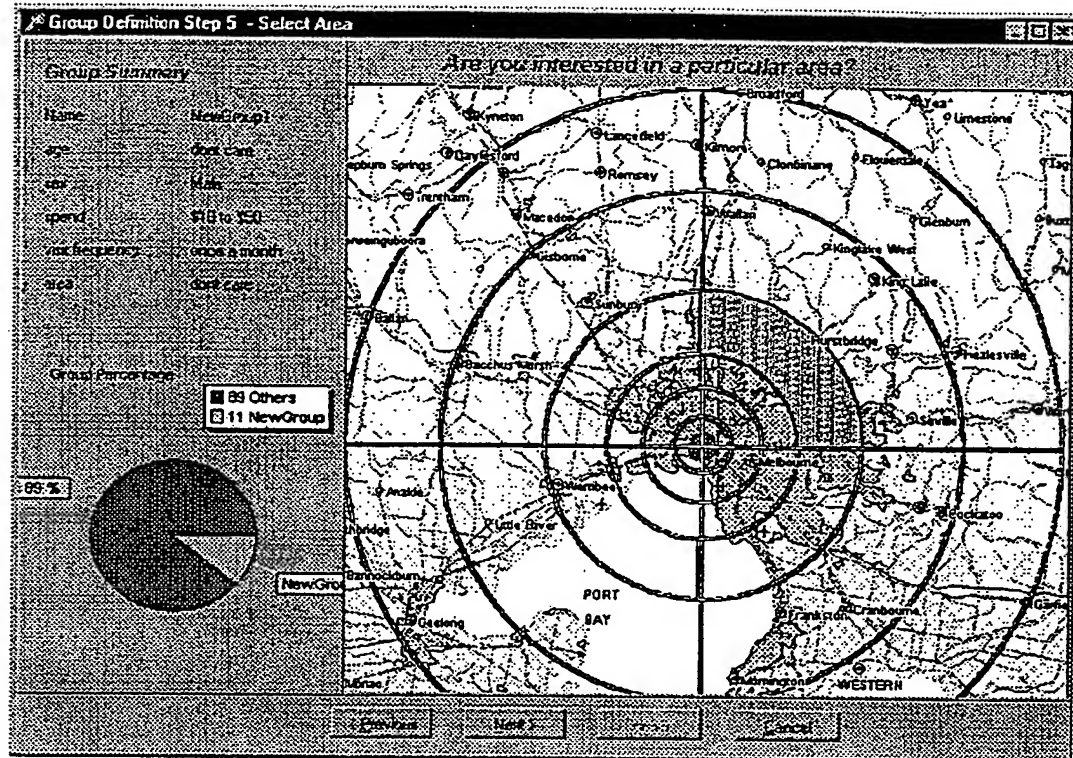


FIGURE 8



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**Group Definition Step 6 - Add group Description**

**Group Summary**

Name	NewGroup1
age	don't care
sex	Male
spend	\$10 to \$50
visit frequency	once a month
area	don't care

Group Percentage

89 %

89 Others

11 NewGroup

Write a group description

Perhaps there is some characteristic behaviour you would expect to see in the people that belong to this group.

Write it down here! It will help you to remember what the group is about, and it may make a interesting reading later when you do analysis work against the group.

Group Description

my new group

Previous Next Finish Cancel

FIGURE 9

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**Group Definition Step 7 - Add group name**

Group Summary

Name	NewGroup1
Age	18-24
Sex	Male
Income	\$10 to \$50
Mail frequency	once a month
Area	East Coast

Group Percentage

89% 89 Others  
11% 11 NewGroup

NewGroup1

What name would like to give to this group?

Give the group a name

Try and think of a descriptive name that captures something essential about the group. It will make a big difference to when you come to select groups for promotions and analysis.

Group Name: NewGroup1

Previous Back Finish Cancel

FIGURE 10

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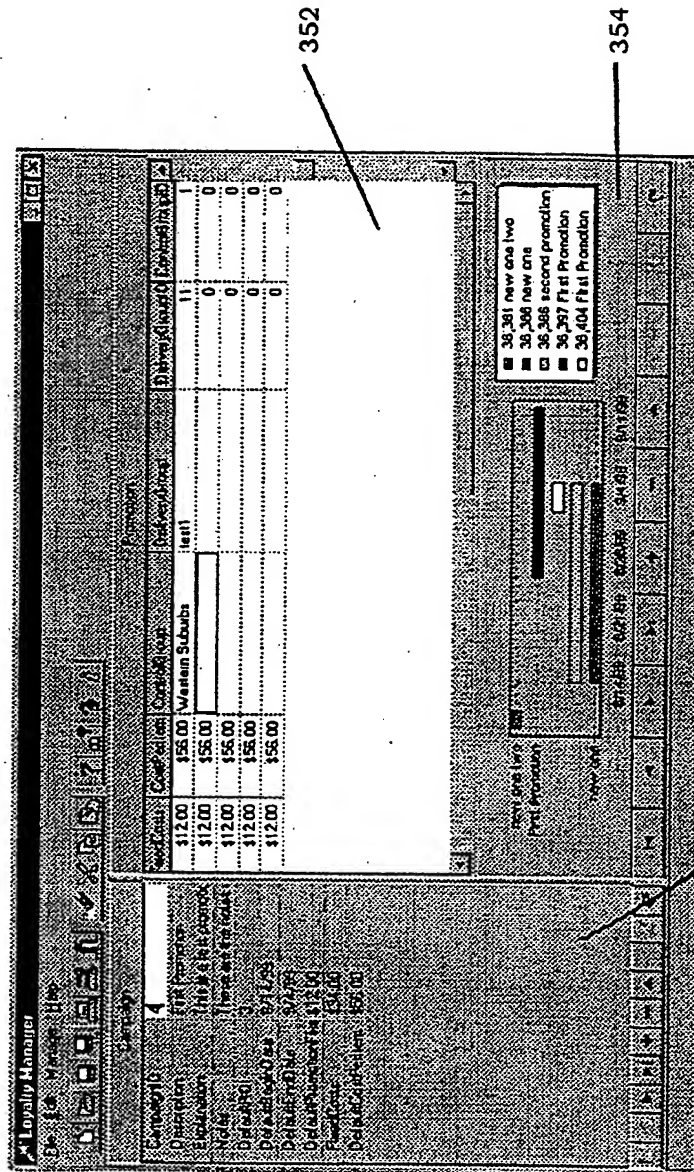


FIGURE 11



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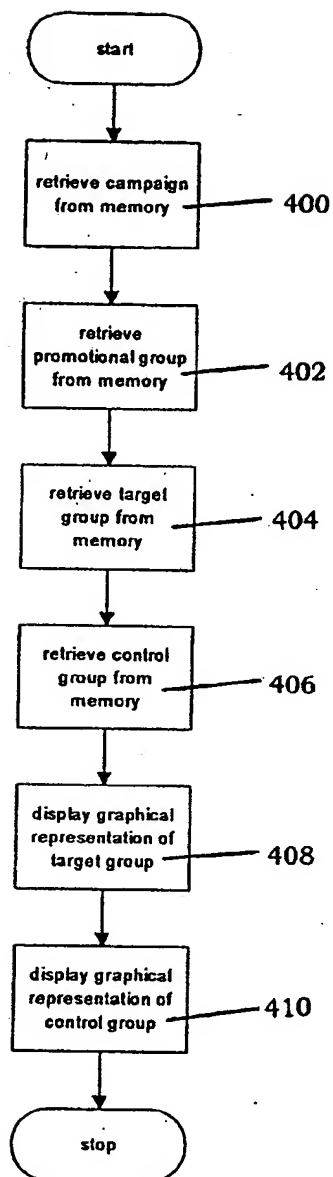


FIGURE 12

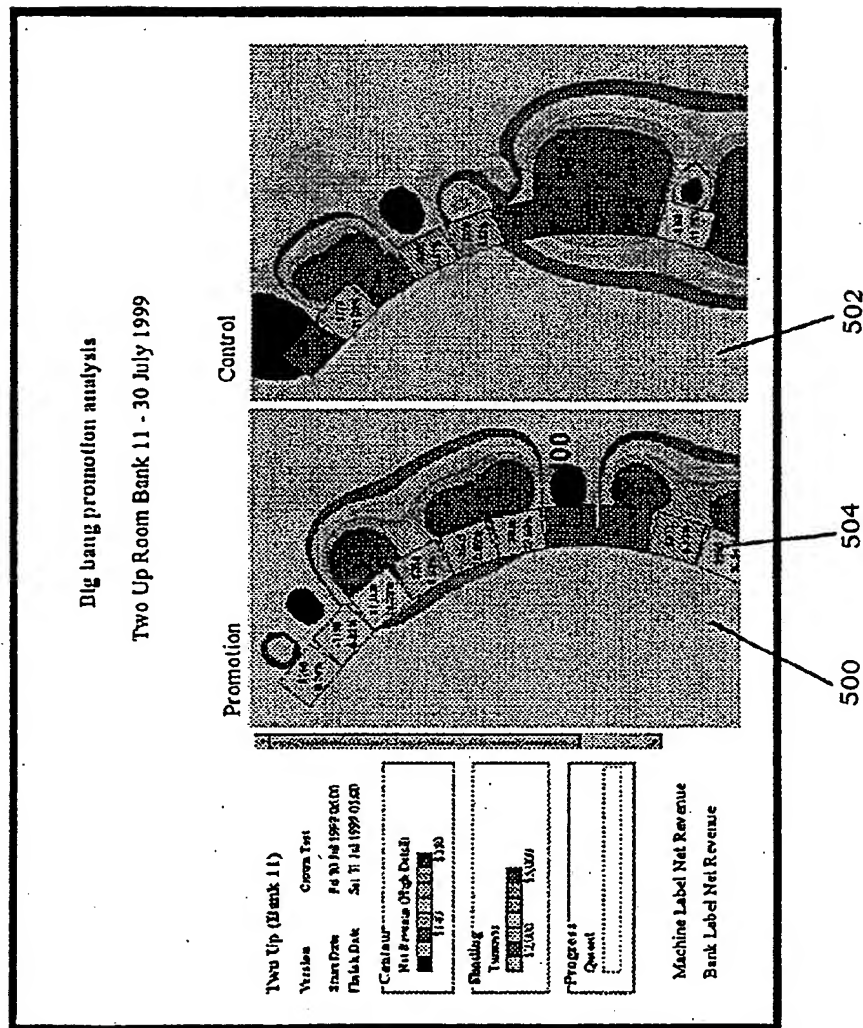


FIGURE 13

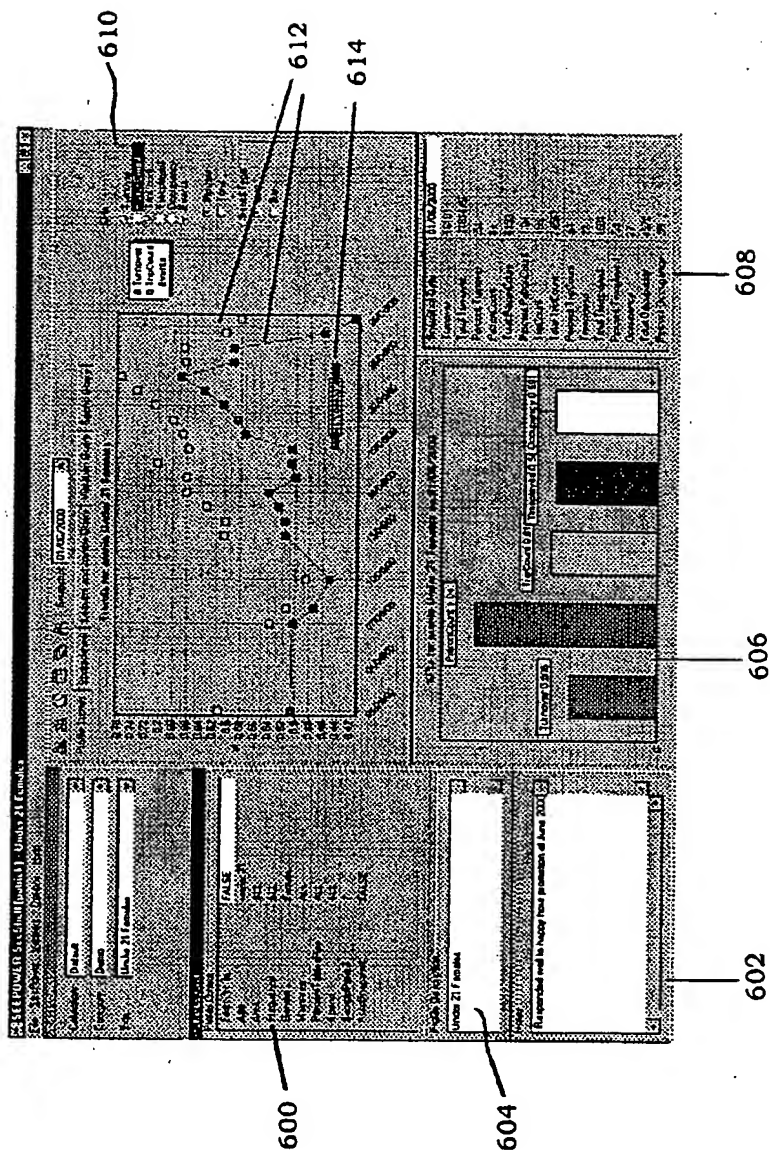


FIGURE 14

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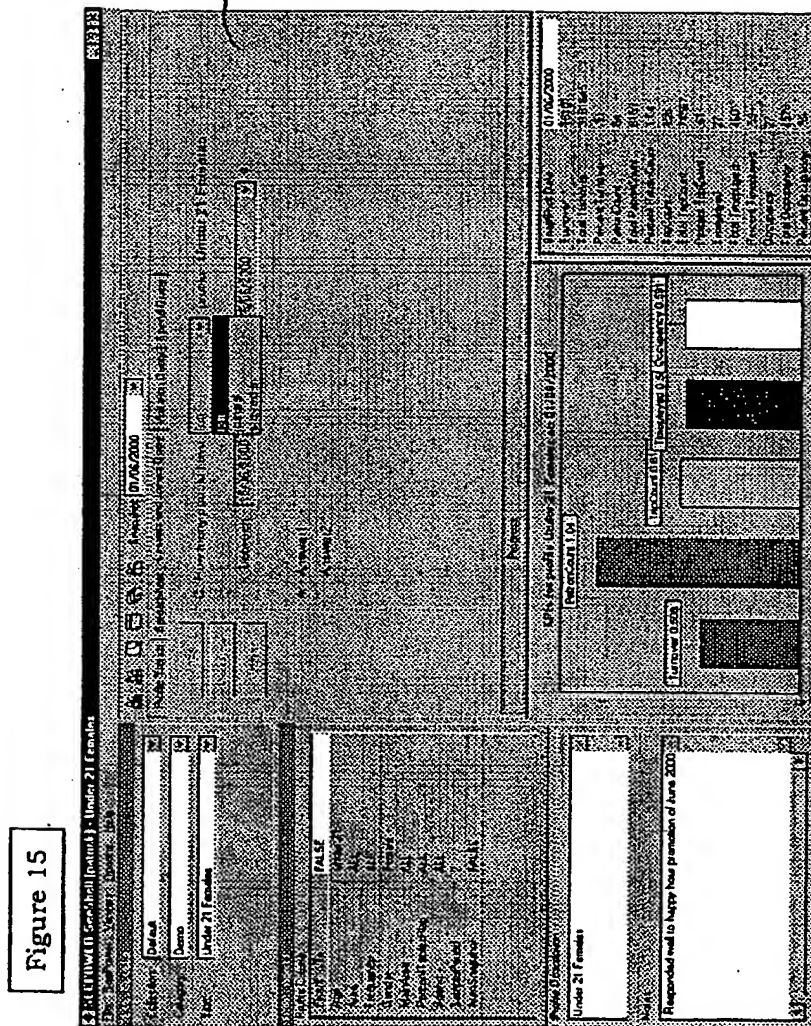


FIGURE 15

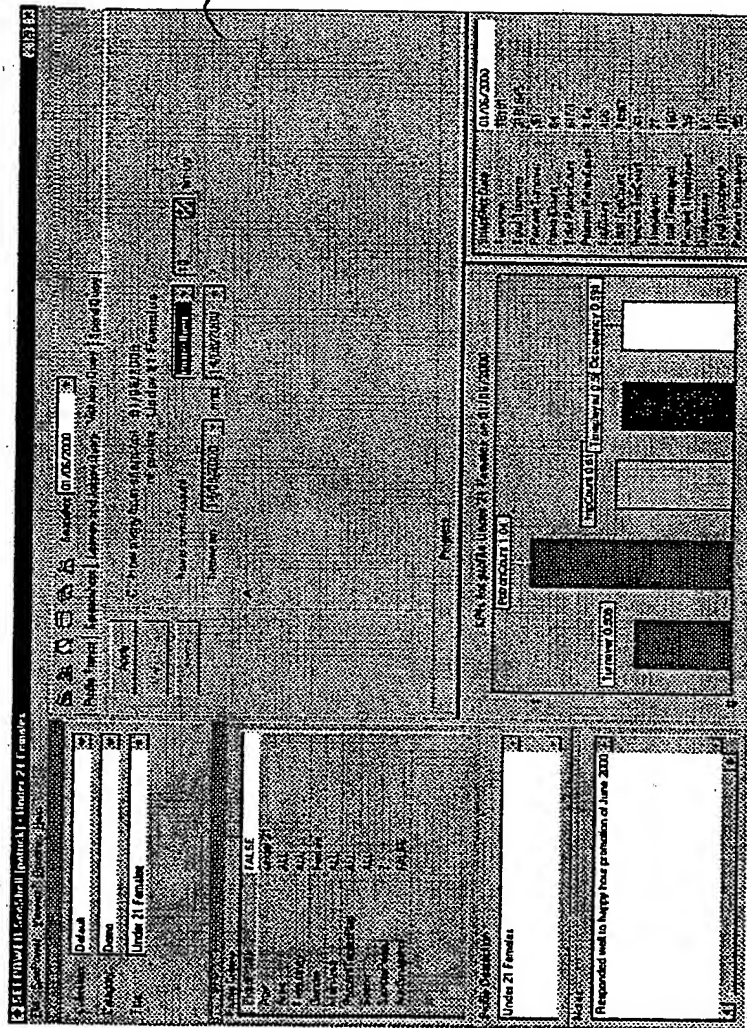


FIGURE 16

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/NZ00/00164

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
Int. Cl. 7: G06F 17/60		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols)		
<b>KEYWORDS: MERCHANT, CUSTOMER, DATABASE, INTERACT, ANALYSE AND SIMILAR TERMS</b>		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
WPAT		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5164983 A (Brown et al.) 17 November 1992 Abstract; Figures; Claims	1, 9, 17
X	AU 55282/94 A (Moore Business Forms, Inc.) 1 September 1994 Abstract; Claims; Page 23, lines 10-13	1, 9, 17
X	WO 99/23596 A (Walker Asset Management Ltd) 14 May 1999 Abstract; Figure 2; Claims	1, 9, 17
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex		
<p>* Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&amp;" document member of the same patent family</p>		
Date of the actual completion of the international search		Date of mailing of the international search report
22 December 2000		10 January 2001
Name and mailing address of the ISA/AU		Authorized officer
AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929		ROSEMARY LONGSTAFF Telephone No : (02) 6283 2637

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/NZ00/00164

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	WO 00/26804 A (Genesys Telecommunications Laboratories, Inc.) 11 May 2000 Abstract; Claims	1, 9, 17
P,X	WO 00/29973 A (Trade Access Inc.) 25 May 2000 Abstract; Figures	1, 9, 17

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.  
**PCT/NZ00/00164**

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report			Patent Family Member		
US	5164983	NONE			
AU	55282/94	US	5974396	NZ	250926
WO	9923596	AU	12856/99	US	6049778
WO	200026804	AU	200013283	US	6138139
WO	200029973	AU	200023454		
					END OF ANNEX



Once the promotional group has been identified and stored, the user identifies a subset of the promotional group to which promotional efforts will be directed. This subset is called the target group as indicated at 204. The customer identifiers of customers in the target group are stored in memory.

5

The target group could comprise the entire promotional group, or it could comprise a subset of the promotional group. In one preferred form the user may be permitted to select the size of the target group, for example. The members of the target group could be selected at random, or could be selected by the user from a list displayed to the user.

10

Once the target group is identified and stored, the system may define a control group, as indicated at 206. The use of a control group is an optional but highly preferred feature of the invention. The control group is useful in assessing the effectiveness of a campaign, as will be described below.

15

The control group is a subset of customers in the promotional group which are not in the target group. The control group is preferably identified by a set of customer identifiers and is stored in memory. It is envisaged that the control group will be approximately the same size as the target group. Alternatively, the control group may be larger or smaller than the target group. It is envisaged that the target group and/or control group could be compiled by randomly selecting customers from the promotional group.

20

The preferred system permits one or more target groups and one or more control groups to be defined and stored for each promotional group, as indicated at 208 and 210. In turn, the preferred system permits one or more promotional groups to be defined and stored for each campaign, as indicated at 212. The user may also select more than one campaign, as indicated at 214.

25

30

Once the target group(s) are stored, the user may retrieve successive target groups from memory. Using the customer identifiers from the target group, the system can retrieve further information from memory about each customer, for example contact details, using the customer identifier as a primary key.

35